Course Competency: The student will demonstrate an understanding knowledge and comprehension of the basic principles of enzyme Histochemistry by:

1. Discussing safety issue in the enzyme Histochemistry laboratory.
2. Defining the following terms:
   i. Enzymes
   ii. Oxidation
   iii. Reduction
   iv. Substrate
   v. Hydrolase
   vi. Simultaneous coupling
   vii. Esterase
   viii. Phosphatase
   ix. Phosphorylase
   x. Epimysium
   xi. Perimysium
   xii. Endomysium
3. Describing the histology of normal muscle
4. Differentiating between type I and type II muscle fibers
5. Listing four types of histochemical reactions for demonstration of hydrolytic enzymes.

Competency 2: The student will demonstrate an understanding knowledge and comprehension of theories enzyme Histochemistry by:

- Communication
- Critical thinking
- Information Literacy
- Ethical Issues
- Computer / Technology Usage
1. Listing three properties of enzymes.
2. Listing 5 factors that influence enzyme demonstration.
3. Listing an artifact that may be seen in unfixed frozen sections.
4. Outlining the basic procedures for preparing muscle for enzyme Histochemistry.
5. Evaluating a storage solution for tissue to be used for enzyme studies

**Competency 3:** The student will demonstrate knowledge and comprehension of enzyme Histochemistry techniques by:

<table>
<thead>
<tr>
<th>1. Employing and describing the reactions for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Alpha-naphthol acetate esterase</td>
</tr>
<tr>
<td>ii. Naphthol AS-D chloracetate esterase</td>
</tr>
<tr>
<td>iii. ATPase</td>
</tr>
<tr>
<td>iv. Acid phosphatase</td>
</tr>
<tr>
<td>v. Alkaline phosphatase</td>
</tr>
<tr>
<td>vi. NADH diaphorase</td>
</tr>
<tr>
<td>vii. SDH</td>
</tr>
<tr>
<td>viii. Phosphorylase</td>
</tr>
</tbody>
</table>

| 2. Evaluating how Naphthol AS-D chloracetate esterase stain differs from most enzyme stains. |
| 3. Summarizing why the pH the NADH diaphorase reaction is critical. |
| 4. Categorizing the diseases indicated by a negative phosphorylase reaction. |

**Competency 4:** The student will demonstrate knowledge, comprehension and application of enzyme Histochemistry techniques by:

| 1. Preparing muscle specimens enzyme Histochemistry testing. |
| 2. Describing artifacts from true enzyme Histochemistry results. |
| 3. Discussing the preferred method of freezing muscle tissue for enzyme Histochemistry studies. |
| 4. Operate and monitor a cryostat and pH meter. |
| 5. Identifying the results of the following stains: |
| i. Alpha-naphthol acetate esterase |
| ii. Naphthol AS-D chloracetate esterase |
| iii. ATPase   |
| iv. Acid phosphatase |
| v. Alkaline phosphatase |
| vi. NADH diaphorase |
| vii. SDH |
| viii. Phosphorylase. |

6. Evaluating, interpreting, and reviewing enzyme Histochemistry results.